



# UNITED STATES PATENT AND TRADEMARK OFFICE

CL  
UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,989	01/26/2004	Sigrid Buhler	14.1-11	6777
61638	7590	09/15/2006	EXAMINER	
SIGMA-ALDRICH CO. 3050 SPRUCE STREET ST. LOUIS, MO 63013			ISSAC, ROY P	
			ART UNIT	PAPER NUMBER
			1623	

DATE MAILED: 09/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/764,989	BUHLER ET AL.
Examiner	Art Unit	
Roy P. Issac	1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 06 July 2006.

2a)  This action is **FINAL**.                                    2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-29 is/are pending in the application.  
4a) Of the above claim(s) 18-29 is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1-17 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/8/04/ 5/24/04.

4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_ .

5)  Notice of Informal Patent Application (PTO-152)

6)  Other: \_\_\_\_\_

**DETAILED ACTION**

This application claims priority to U.S. provisional application no. 60/449,070 filed on February 21, 2003.

***Election/Restrictions***

Applicant's election with traverse of the invention of Group III, claims 1-17 drawn to compounds of general structure I wherein Z is a deoxyribonucleoside or a ribonucleoside is acknowledged.

The traversal on the grounds that the Markush claims were improperly grouped apart was considered and found persuasive. Accordingly, restriction between Groups I, II and III are withdrawn. Thus, Groups I, II and III will be examined here together as one group.

Inventions of Group I-III and IV-IX are independent and distinct for the reasons set forth in the prior office action, mailed 6 June, 2006. Applicant's assertion that the examination of these inventions together will not constitute serious burden on the examiner was not found persuasive. Applicant's assertion that no reasons were given for the restriction requirement and that the office has not met its burden of establishing the restriction requirement was also not found persuasive. The search for inventions of groups I-III and IV-IX will place an undue burden on the Office. The search field for the group of compounds is non-coextensive with the search field for a method or a process of making the same compounds. A reference to the compound herein would not necessarily be a reference to the method of making the same herein. The

compounds and methods of preparation and use have separate consideration as to patentability.

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

The restriction requirement between Inventions I-III and IV-IX was deemed proper and is therefore made FINAL.

Claims 18-29 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction requirement in the reply filed on 6 July 2006.

Claims 1-17 will be examined on the merits herein.

### ***Claim Objections***

Claims 9, 10 and 11 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 9-11 depend from claim 8. Claim 8 limits recites "protective group selected from the group consisting of phenoxyacetyl, 4-tert-butyl-phenoxyacetyl, 4-isopropyl-phenoxyacetyl or dimethylformamindino." The protective groups listed in claims 9-11 are not selected from the above listed Markush group protecting groups. As such, claims 9-11 are improperly broader than claim 8 from which they depend.

***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Omum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-17 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 5,763,599.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the '599 patent discloses compounds that are covered by the genus claim as well as position isomers of the instant application.

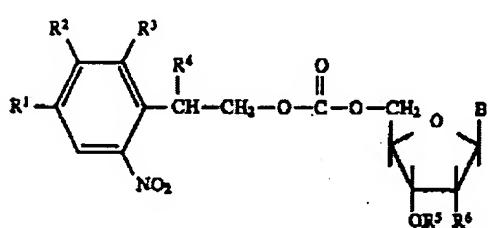
The claims of the instant application are drawn to compounds of the general formula 1. Note that some of the compounds of the general formula 1, and the compounds claimed in the '599 patent are either the same or position isomers.

The '599 patent does not expressly disclose the specific compounds where R1 is COOY, wherein Y is selected from the group consisting of an optionally substituted alkyl group of up to 10 carbons, under the proviso that R2 is selected from the group

Art Unit: 1623

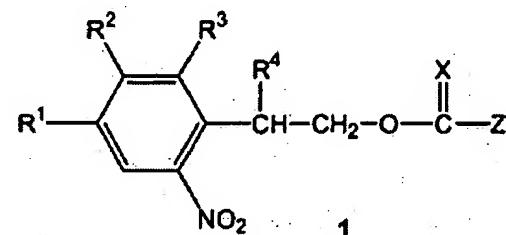
consisting of H, NO<sub>2</sub>, CN, OCH<sub>3</sub> or halogen or is an optionally substituted alkyl or alkoxyl group, respectively, having up to 4 carbon atoms; or R<sub>1</sub> is selected from the group consisting of H, NO<sub>2</sub>, CN, OCH<sub>3</sub> or halogen or an optionally substituted alkyl or alkoxy group respectively, having up to 4 carbon atoms, under the proviso that R<sub>2</sub> is selected from the group consisting of an optionally substituted aryl group, an optionally substituted heteroaryl group or an optionally substituted aroyl group.

Claims 1-14 of the '599 patent claims compounds with the following formula;



R1= alkoxyalkyl having 1-4 C atoms  
R2= H or OCH<sub>3</sub>

**The '599 patent**



R1=COOY; Y is alkyl group  
R2= H

**The instant application**

Furthermore, the '599 patent discloses compounds with phosphoramidite substituents at the R<sub>5</sub> position (Claim 1, Column 28; lines 37-67 Column 24-25, Summary of the Preparation Examples, Compounds 15-17). The substituents at the R<sub>3</sub> and R<sub>4</sub> position are identically disclosed as the instant application. (Column 28, lines 50-60; Claim 1). The substituents R<sub>5</sub> and R<sub>6</sub> have significant overlap with the instant application. (Column 28, lines 57-67; Claim 1). The '599 patent further discloses substitution of Sulfur and Oxygen at the R<sub>6</sub> position as well as the use of protecting groups including silyl groups for oxygen. In particular, alkyl, alkenyl, acetal, S-alkyl, O-Methyl, O-ethyl, O-alkenyl O-allyl, O-acetal and O-tetrahydropyranyl groups are disclosed. (Column 28, lines 37-67, Claim 1; Column 2, lines 52-65). The '599

patent discloses the use of the bases adenine, cytosine and guanine, and the protective groups p-NPEOC and ethylformamidino. (Column 29, lines 30-40, claims 10,11 and 13).

One of ordinary skill in the art would have been motivated to make the compounds with the general formula I and the particular compounds of claims 1-17 of the instant application, because the compounds of claims 1-17 are broadly disclosed in the '599 patent.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites the phrases "a leaving group", "a functional group useful in oligonucleotide synthesis", "a protective group useful in oligonucleotide synthesis" "chemically modified", "analog thereof", and "chemical modifications thereof". Said phrases do not convey a structural formula or chemical name to one of ordinary skill in the art. Even though, the phrases "leaving group" and "protective group" are described using functional language and examples are given they are not clearly defined in the specification. In the absence of a structural formula

or chemical name, all claims reading upon a compound of general formula I wherein each variables are not distinctly claimed are indefinite as one of ordinary skill in the art would not be apprised of the metes and bounds of claimed invention.

Claim 13 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim recites the phrase "intermediate OH-protective group". Said phrases do not convey a structural formula or chemical name to one of ordinary skill in the art. In the absence of a structural formula or chemical name one of ordinary skill in the art would not be apprised of the metes and bounds of claimed invention.

Claims 9-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9-11 recites the limitations, "the protective group is selected from the group consisting of benzoyl or p-nitrophenyloxycarbonyl (p-NPEOC)," "the protective group is selected from the group consisting of isobutyroyl or p-nitrophenylethyoxy carbonyl (p-NPEOC)", and "benzyol, t-isobutyroyl or p-nitrophenylethyoxy carbonyl (p-NPEOC)", respectively, in the last two lines of claim 9-11. Claims 9-11 depends from claim 8, which includes the recitation, "protective group selected from the group consisting of phenoxyacetyl, 4-tert-butyl-phenoxyacetyl, 4-isopropyl-phenoxyacetyl or dimethylformamindino". Claims 9-11 includes other protective groups in their Markush grouping. There is insufficient antecedent basis for this limitation in the claim.

Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1, from which claims 2-17 depend, recites "optionally substituted" in reference to alkyl, alkoxy, aryl, and aroyl heteroaryl groups. Claims 3 and 4 additionally recites "optionally substituted" in reference to phenyl and benzyl. The specification does not clearly define or point out what type of groups will be used in substitution and in what positions the substitutions will occur. As such, said recitation renders the claims indefinite.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

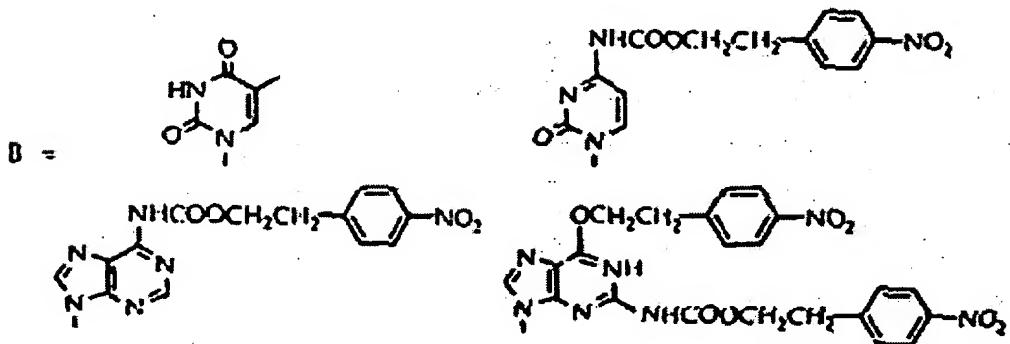
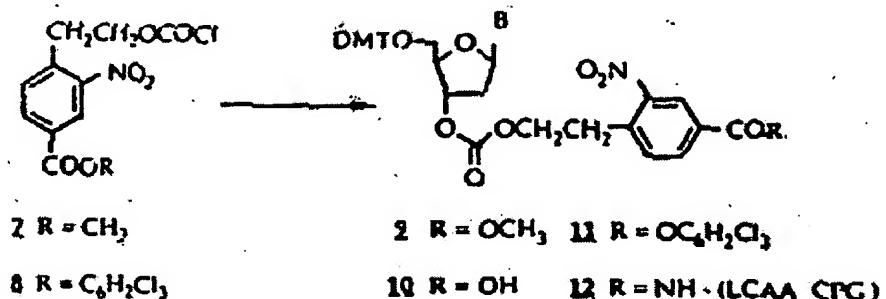
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 8-11, 12 and 16-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Eritja R. et. al. (PTO-1449; Included by the applicant). Compound 9 of Eritja et. al., (structure shown in the figure below) reads on compounds of claims 1-2 and 13-14. (Figure 2, Page 4173 and Page 4179, Paragraphs 4-5). Eritja et. al. discloses the substitution of bases thymine, protected-adenine, protected-guanine, and protected cytosine. (Page 4173, Figure 2, and Page 4180, First Paragraph, Compounds, 9 B=4-N-NPEOC-Cytidine and 9B =6-NPEOC-adenine.) These compounds read on claims 9-11. (Bases with protective groups is shown below).

Eritja et. al. further discloses the use of phosphoramidites as O-protecting group.

(Page 4173, Last paragraph).



Eritja et.al further discloses compound 7, (structure shown in the figure above), that read on compounds of claims 16 and 17. (Page 4173 and Page 4179, Paragraph 2).

Thus, claims claims 1-2, 8-11, 12 and 16-17 are anticipated by Eritja et. al.

***Claim Rejections - 35 USC § 103***

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pfleiderer et. al. (U.S. Patent No. 5,763,599; PTO-1449, Included by the applicant).

The disclosure of the '599 patent is discussed above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the compounds of the instant application because they are broadly covered by the disclosure of the '599 patent.

One of ordinary skill in the art would have been motivated to make the compounds of the general formula I, and in particular the compounds the genus and sub-genus in claims 1-17 because they are disclosed in the '599 patent.

Thus claims 1-17 over the teachings of the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roy P. Issac whose telephone number is 571-272-2674. The examiner can normally be reached on 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia Anna Jiang can be reached on 571-272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Roy P. Issac  
Patent Examiner  
Art Unit 1623

  
S. Anna Jiang, Ph.D.  
Supervisory Patent Examiner  
Art Unit 1623